

The WRPS radiological control count room performed a gamma energy analysis (GEA) of the annulus CAM filter paper. Preliminary results appeared to be radon progeny and ^{137}Cs . The sample was sent to the 222-S Laboratory, which reported the results shown in Table 1-1. After the annulus exhauster was restarted, the CAM readings returned to normal.

Table 1-1. Sample Results

	α $\mu\text{Ci/mL}$	β $\mu\text{Ci/mL}$	β ncpm
Initial	6.40E-13	4.32E-11	18,840
1-day decay	2.16E-13	4.22E-11	18,400
7-day decay	3.06E-14	4.14E-11	18,270

The primary tank headspace and the annulus ventilation system are cross-connected via floor drains in the annulus pump pit and the leak detection pump pit. The cross-connections provide a pathway for contamination to enter the annulus. The floor drains are kept sealed by maintaining the primary tank liquid level above 60 in. On several occasions in the mid-1980s, the Tank AY-102 liquid level dropped below the level needed to maintain the seals. These events are believed to be the source of low levels of legacy contamination sometimes found in the annulus pump pit and elsewhere. The source of the CAM alarm was believed to result from this legacy contamination.

ENRAF Leak Detector Failure

On March 10, 2012, the Riser 90 ENRAF 152 was declared out of service. During planned repairs on May 24, 2012, the ENRAF displacer wire broke while trying to retrieve the stuck displacer on the annulus floor. On June 4, 2012, a bullet-style video camera identified that the displacer was in a location that would interfere with the performance of a replacement ENRAF displacer. The majority of fallen wire was removed but attempts to retrieve or move the displacer from the bottom of the annulus were unsuccessful. Subsequent annulus inspections indicated white material on the annulus floor at the Riser 90 location and that the displacer was apparently embedded in it (see Section 4.2.4.1). On July 24, 2012, the upper flange of the riser was rotated to avoid the displacer and debris on the annulus floor. A replacement ENRAF 152 drum and displacer were installed on Riser 90; the ENRAF was functionally tested and returned to service (TFC-WO-12-2156, "241-AY Annulus ENRAF Cals and Functional Tests").

1.2.3 2012 Inspections and Sample Results

Continuing Annulus Inspections

The results of the comprehensive annulus inspections in August, September, and October 2012 identified unexpected changes near Risers 77, 83, 87, 89, and 90. All of the areas are located on the annulus floor or on the refractory except for Riser 89 where crystal-like growth was found on the primary top knuckle where the primary tank and the secondary liner converge.

Sample Results – Annulus and Leak Detection Pit

August 10, 2012 Riser 90: A double-sided tape wrapped weight was used to obtain a sample of material on the annulus floor. Most of the material appeared to be rust, with a few blue-colored flakes. Qualitative analysis indicated the bulk of the sample was dominated by rust (iron and oxygen), the blue particulate indicated kaolinite, with the remainder of the particulate, light gray to amber, being fairly uniform with sodium, potassium, carbon, oxygen, phosphorous, and